EV-C/D and FP open, these were 41% and 32% for reinterventions and 20% and 17% for a new bypass, respectively. The overall amputation rate was 1.2%.

Conclusions: Clinical benefit for DC is excellent in AI, irrespective of TASC, and in FP segment with TASC A/B. Acceptable durability in FP TASC C/D can be achieved, however reinterventions are frequently needed, irrespective of type of revascularization.

Table. Primary (PP), secondary patency (SP), sustained clinical success (SusClSuc) and secondary clinicals

	PP		*SP*		*SusClSuc*		*SecClSuc*	
Variable	*24 mo (%)*	*48 mo (%)*	*24 mo (%)*	*48 mo (%)*	*24 mo (%)*	*48 mo (%)*	*24 mo (%)*	*48 mo (%)*
AI open (n = 47)	91 ± 4	91 ± 4	94 ± 4	94 ± 4	91 ± 4	91 ± 4	96 ± 3	96 ± 3
AI A/B (n = 91)	94 ± 3	87 ± 4	98 ± 2	98 ± 2	90 ± 3	75 ± 5	98 ± 2	98 ± 2
AI C/D (n = 35)	100	100	100	100	100	100	100	100
P		.425		.206		.118		.429
FP open (n = 60)	64 ± 6	54 ± 7	75 ± 6	71 ± 6	64 ± 6	54 ± 7	86 ± 5	80 ± 6
FP A/B (n = 29)	93 ± 5	83 ± 8	97 ± 3	97 ± 3	93 ± 5	83 ± 8	100	100
FP C/D (n = 51)	46 ± 7	46 ± 7	68 ± 7	63 ± 7	46 ± 7	46 ± 7	82 ± 6	82 ± 6
P		.001		.005		.002		.043

A Comparison of Rigid vs Soft Dressings in the Healing of Below Knee Amputations (BKA)

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Introduction and objectives: There is no standard protocol for the selection of surgical dressings after a below knee amputation (BKA). The purpose of this study was to compare rigid dressings with soft dressings on the healing times of BKA. We hypothesized that rigid dressings would facilitate faster wound healing and residual limb maturation by minimizing postsurgical edema and pain, preventing knee flexion contracture, and protecting the residual limb from trauma.

Methods: Our retrospective analysis compared 151 patients who underwent BKA from 2000 to 2012 at Yale New Haven Hospital, after which 60 patients received soft dressings and knee immobilizers (soft) after the amputation, and 92 were placed in a rigid plastic or plaster prosthesis (rigid). Demographics and outcomes, including time between amputation and initial casting of prosthesis, were compared.

Results: Age and diabetic status was not statistically different between the soft (61.0 years, 82.8% with diabetes) and rigid groups (58.6 years, 78.0% with diabetes). After BKA, the rigid dressing group demonstrated significantly decreased time spans from amputation to initial casting, as shown by the Fig ($P < .02$ by log-rank and Wilcoxon test) and the Table. After 60 days, 58.24% of the rigid group was cast, compared with 38.33% of soft group ($P < .03$ by t test).

Conclusions: Use of a rigid dressing after a BKA significantly shortened the time to healing, as assessed by the time to casting. Use of a rigid prosthesis allows for consistent dressing changes of the healing BKA stump while facilitating inspection of the limb.

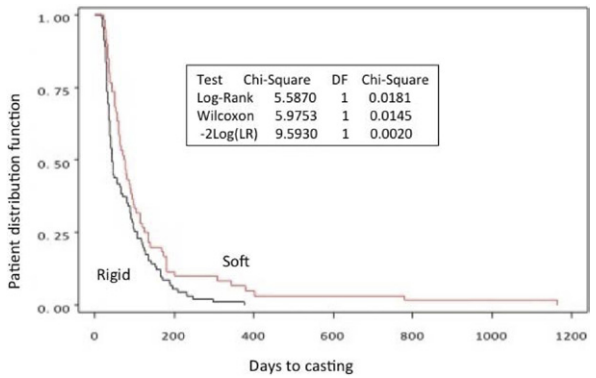

Fig.

Table. Days to casting

			Percentile	
Type of dressing	*Median*	*Mean*	*25th*	*75th*
Rigid	43	76	30	102
Soft	75	127	41	127

Open Surgical Revision of Unfavorable Vein Graft Lesions Provides a More Durable Repair

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Introduction and objectives: Prior studies have demonstrated that favorable vein graft lesions (single, <2-cm lesions in grafts older than 3 months) can be treated successfully with percutaneous transluminal angioplasty (PTA) and other endovascular techniques. However, the optimum treatment method for unfavorable lesions is not yet clear.

Methods: This was a retrospective review (2000-2011) of patients undergoing PTA or open revision of failing infrainguinal vein grafts. Demographics, comorbidities, lesion characteristics, and procedural information were recorded. Failure was defined as restenosis by duplex scan, occlusion, redo PTA, surgical revision, or amputation. Cox proportional hazard models and life-table analyses were performed. We report 12-month failure rates.

Results: We studied 176 failing vein grafts in 169 patients: 84 grafts underwent PTA and 92 open revision. Mean age was similar between PTA and open revision (67.5 vs 69.5 years, $P = .28$) as was the proportion with asymptomatic failing grafts (54.7% vs 52.1%, $P = .76$). Grafts undergoing PTA were more likely to be unfavorable (64.3% vs 45.7%, $P < .01$) with multiple lesions (32.1% vs 14.1%, $P < .01$) and lesions >2 cm (44.0% vs 21.7%, $P < .01$). Overall, PTA failed more than open revision (65.4% vs 44.5%, $P < .01$). Freedom from PTA failure was greater in favorable lesions compared with unfavorable (52.3% vs 30.5%, $P < .01$). Favorability had no influence on freedom from open revision failure (65.7% vs 70.5%, $P = .072$). Among favorable lesions, there was no difference in freedom from failure between PTA and open revision (52.3% vs 65.7%, $P = .68$). However, unfavorable lesions fared much worse after PTA (30.5% vs 70.5%, $P < .01$; Fig). There were no predictors of open revision failure. Unfavorable lesions (HR, 2.17 [1.16-4.00]; $P = .01$) predicted PTA failure, primarily driven by bypass graft age < 3 months (HR, 2.84 [1.36-5.93]; $P < .01$).

Conclusions: Open revision of unfavorable vein graft lesions provides greater freedom from failure and should be the primary therapy for failing vein grafts with unfavorable lesions. Favorable vein grafts should continue to be treated endovascularly.

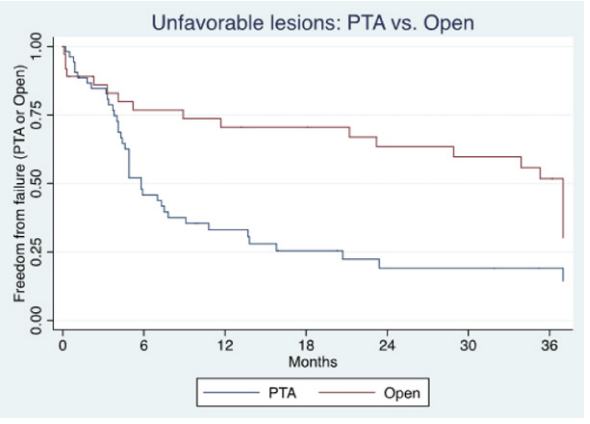

Fig.

Thirty-Day Readmission Following Lower Extremity Bypass for Critical Limb Ischemia (CLI) in the PREVENT III Cohort

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Introduction and objectives: Hospital readmission after lower extremity bypass (LEB) is an economic burden and a focal point for policy

change directed at disease-specific bundling strategies. This study was performed to evaluate rates and predictors of 30-day readmission from a multicenter trial data set.

Methods: We analyzed the PREVENT III data set of 1404 CLI patients undergoing LEB at 83 North American centers. The primary end point was readmission ≤30 days of discharge. Secondary end points included graft patency and limb salvage evaluated in the context of readmission.

Results: We analyzed 1356 patients, of these, 23 (1.7%) died in-hospital and were excluded from re-admission analyses. Overall, 327 of 1333 patients (24.5%) were readmitted ≤30 days of discharge. Reasons for readmission included 127 (39%) wound infections in the index leg, 75 (23%) nonvascular reasons, 68 (20.9%) additional procedures in the index leg, and 19 graft failures (5.8%). Univariate predictors are shown in the Table. Adjusted independent predictors of 30-day readmission included wound infection (odds ratio [OR], 4.1; 95% confidence interval [CI], 3.0-5.4; $P < .0001$), renal failure (OR, 4.1; 95% CI, 1.9-8.8; $P = .0004$), early lost patency (OR, 1.9; 95% CI, 1.2-2.9; $P = .003$), dialysis (OR, 1.8; 95% CI, 1.2-2.6; $P = .003$), and female gender (OR, 1.3; 95% CI, 1.0-1.8; $P = .03$). Patients readmitted ≤30 days had lower rates of limb salvage at 1 year (78% ± 2.4% vs 91% ± 0.9%, $P < .0001$). Thirty-day readmission was predictive of limb loss (HR, 2.25; 95% CI, 1.6-3.1; $P < .0001$) at 1 year, after adjustment for other factors.

Conclusions: Readmission after LEB for CLI is common (24%) and associated with defined clinical predictors. Readmission is associated with long-term limb loss. These data provide benchmark values for this complex patient population and may prove useful as disease-specific bundling strategies are derived.

Table. Univariate predictors of 30-day readmission after vein graft bypass for CLI

	30-day readmission		
Factors	*No*	*Yes*	*P*
Pre-op factors, No. (%)			
Female gender	333 (33.1)	142 (43.4)	.0008
Dialysis dependence	109 (10.9)	52 (15.9)	.02
Tissue loss indication	733 (72.9)	255 (78.0)	.05
Post-op factors			
Length of stay, mean [SD] days	8.4 [8.9]	9.7 [9.1]	.0009
Wound infection, No. (%)	140 (13.9)	133 (40.7)	<.0001
Acute renal failure, No. (%)	15 (1.5)	17 (5.2)	.0005
Early graft-related event, No. (%)	76 (7.5)	44 (13.5)	.002

The Endurant Stent-Graft U.S. Clinical Trial: 2-Year AAA Diameter Outcomes Are Predicted by 6-Month Volume Outcomes

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Introduction and objectives: This study reports the 2-year diameter and volume data for abdominal aortic aneurysms (AAAs) treated in the U.S. pivotal clinical trial of the Endurant Stent Graft System.

Methods: From April 2008 to May 2009, 150 patients were treated with the Endurant stent graft as part of a prospective multicenter trial. The main inclusion criteria were AAA diameter >5 cm, neck length ≥10 mm, and neck angulation <60°. A core laboratory reviewed all imaging. Expansion was defined as >5 mm diameter or >5% by 3-dimenional volume.

Results: Stent graft implant was successful in 149 of 150 patients. The 6-month volume results were nearly identical to the 24-month diameter results, and all AAAs identified with expansion by diameter at 24 months had expansion by volume criteria (but not diameter) at 6 and 12 months. Change in AAA size was more likely to be identified by volume at all time points, with <13% of AAAs classified as "no change" by volume criteria at 1 and 2 years ($P < .05$). Most AAAs classified as "no change" by diameter criteria were shrinking by volume criteria. Secondary intervention for endoleak occurred in five patients, all suspected type II endoleak. All were identified as expanding earlier by volume, including two ultimately identified to be a type I endoleak. There were no ruptures or aneurysm-related deaths.

Conclusions: Midterm results of the Endurant pivotal trial are good, with low expansion rates at 2 years, even by volume criteria. Three-dimensional volume detects aneurysm shrinkage and expansion on average 18 months sooner than diameter, allowing for earlier reassurance in most patients and earlier intervention in the small minority who need it.

Table. AAA outcomes over time

Outcome	*Decrease (%)*	*No change (%)*	*Increase (%)*
Diameter			
6 mon	31	69	0
12 mon	47	53	0
24 mon	63	35	2
Volume			
6 mon	63	34	4
12 mon	79	13	7
24 mon	78	12	10

The Effect of Chronic Oral Anticoagulation on the Durability and Success of Endovascular Aortic Aneurysm Repair (EVAR)

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Introduction and objectives: It has been suggested that long-term use of warfarin can affect the durability of endovascular aneurysm repair (EVAR) by continued sac expansion, possible rupture, and the need for further surgical interventions. The purpose of this study was to determine whether chronic anticoagulation therapy with warfarin is associated with an increased risk of rupture or need for reintervention after EVAR.

Methods: We reviewed the records of 401 consecutive patients who underwent EVAR at a single institution from 2003 until 2011. Patients on warfarin were compared with a control group not anticoagulated. Primary end points were rupture, explant, reintervention, death, and a composite outcome if any of these occurred. The presence of an endoleak at last follow-up and change in aneurysm sac size of >5 mm were secondary end points. Cox proportional hazards models were used to estimate the effect of warfarin use on the primary and secondary outcomes, controlling for age, sex, obesity, specific comorbidities, antiplatelet drugs, statin use, and urgency of EVAR.

Results: Of 401 patients, 363 (90.5 %) with a median follow-up period of 29 months had sufficient data for analysis. Warfarin use was not associated with an increased risk of any of the primary or secondary end points (Table). After controlling for covariates and length of observation via Cox proportional hazards models, we found the effect of warfarin remained insignificant. There was an increased in endoleak rate and adverse outcomes after emergency EVAR and in those patients deemed unfit for open surgical repair.

Conclusions: Chronic oral anticoagulation with warfarin does not appear to affect the incidence of endoleak after EVAR or the need for reintervention. Adverse long-term results are more likely after emergency EVAR.

Table.

Variable	*No.*	*Death, No. (%)*	*Explant, No. (%)*	*Reintervention, No. (%)*	*Any of these, No. (%)*
Warfarin	68	7 (10)	3 (4)	6 (9)	16 (24)
No warfarin	295	35 (12)	5 (2)	25 (8.5)	65 (22)
P		NS	NS	NS	NS

Atrio-Femoral Bypass With Motor-Evoked Potential Monitoring Lowers the Rate of Death and Paraplegia After Complex Thoracoabdominal Aortic Aneurysm Repair

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Introduction and objectives: We recently reported improved early mortality and paraplegia rates in a small cohort of patients with type I-III thoracoabdominal aortic aneurysms (TAA) treated with atrio-femoral bypass (AFB) and motor-evoked potentials (MEVP) when compared with a propensity-matched cohort of patients treated with the clamp-and-sew method (CS). The use of AFB/MEVP increases the level of complexity of TAA repair, and it is unclear if the early benefits will be sustained when this is applied to a general population with type I-III TAA, which is the goal of this study.

Methods: Consecutive patients undergoing repair of nonruptured Crawford extent I-III TAA from January 1987 to December 2011 were identified. Patients were stratified according to operative approach (AFB/MEVP vs CS). End points included long-term survival and the composite outcome of perioperative death and paraplegia. A multivariate, risk-adjusted